cervine species, are now represented in south-eastern Asia and the Sunda islands. The occurrence of these animals in tropical countries at the present day does not, however, necessarily imply a tropical climate in Pliocene Italy. Some instances in modern geographical distribution are quoted in illustration of this opinion. It is probable that the Pliocene fauna of Europe extended as far as Celebes, and has been preserved in the Indian archipelago by isolation.

In conclusion it was shown that the preservation of a Miocene form, *Myolagus sardonis*, in the Pleistocene bone-breccias of Corsica and Sardinia, and the occurrence of *Elephas meridionalis* and *Mastodon arvernensis* in beds of different age on opposite sides of the Alps, are instances in support of the view that a single mammalian species or even a few species cannot be sufficient to determine the age of beds.

In a note appended to the paper, Prof. Boyd Dawkins contested the opinion that no species pass from Miocene to Pleistocene beds, especially in the case of *Hippopotamus major* of the former and *H. amphibius* of the latter.

9. "Notes on some Cretaceous Lichenoporidæ." By G. R. Vine, Esq. Communicated by Prof. P. Martin Duncan, F.R.S., F.G.S.

In this paper the author referred to the views of Mr. Hincks on the genera belonging to the family Lichenoporidæ, and especially to his suppression of the genus *Radiopora* of D'Orbigny, the species of which are placed by Mr. Hincks in the genus *Lichenopora*. The author remarked that the type species of the division of the latter genus identified by Mr. Hincks with *Radiopora*, D'Orb., the Lower Greensand *Radiopora pustulosa*, D'Orb., and other fossil species show structural peculiarities which would seem to distinguish them, although perhaps not generically. He described in some detail the characters of the above-mentioned species under the name of *Lichenopora pustulosa*; and further described what he believed to be a new species from the Greensand of an unknown locality under that of *Lichenopora paucipora*.

MISCELLANEOUS.

On Paludicella erecta.

Mr. Edward Potts desired to have a preliminary record made of his recent discovery or identification of a new species of *Paludicella* for which he proposes the name of *Paludicella erecta*.

This genus of freshwater Polyzoa has heretofore contained only the single clearly defined species *P. Ehrenbergi*, Van Beneden (*Alcyonella articulata*, Ehrenberg), the other two names, *P. procumbens* and *P. elongata*, suggested by Mr. Albany Hancock and Prof. Leidy, being considered by Prof. Allman as identical with the original type. The present form is strikingly different from the old one, both in the number of its ciliated tentacles and in the character of the cœnœcial cells. The doubt which has lingered in the mind

of the speaker has not been as to the species, but whether in view of the difficult determination of the characteristic septa between the cells, amounting, in fact, to an apparent absence of them, a new genus might not be required to accommodate it.

It was first noticed in Tacony Creek, a small stream in Montgomery County, Pennsylvania, at that place perhaps 50 feet above tide-water. A few days after it was also gathered within tidal limits in both the Delaware and Schuylkill rivers, near Philadelphia. In the first-named locality it was found most abundantly in the pools amongst the rapids of the stream, frequently covering the upper surface of stones, at the depth of a foot or more, to the extent of many square inches. The erect portions of the cœnœcial cells in the denser parts of the colonies are about a line in height, and, standing very closely, suggest a comparison with the surface of a chestnut-burr. In the rivers they were found penetrating the mass of incrusting sponges, particularly *Meyenia Leidyi*.

These upright tubules are chitinous prolongations of very irregularly inflated cells, resting in compact disorder upon the supporting surface, crossed and connected in some manner not yet intelligible, by meandering cylindrical rhizomes, sometimes of great relative length. These are mostly terminal and simple, but are sometimes branched, and frequently originate in an indifferent lateral portion of a cell. The tubular prolongations are, of course, always single; the invaginated polyp retiring within the inflated portion of the cell. Septa were, in a few instances, discovered in the rhizomes near their insertion or connection with the inflated portion of the cells. The upright portion of those cells which seemed to be least matured were longer than those of their older neighbours, subclavate or spindle-shaped and rounded at the extremities. The others are cylindrical or slightly widening downwards, and shorter than the former by the invagination of the terminal portion of the ectocyst. This has the effect of producing the angular appearance of the orifice so familiar in the older species; but while that is generally quadrangular, this has frequently five or more sides. The younger cells are nearly transparent, but they darken with age and become somewhat incrusted with adherent particles and overgrown by commensal parasites, *Limnias*, *Pyxicola*, and the like.

The polypides are shy, but fond of the light, and when otherwise undisturbed will remain for a long time protruded in the full glare of microscopic illumination. It can then be seen that the lophophore is circular, without epistome, supporting ordinarily twenty tentacles, taking the shape of a claret-glass and opening upwards. (Nineteen and twenty-one tentacles have been doubtfully counted, while the above-mentioned number is frequent; *P. Ehrenbergi* is universally stated to have but sixteen.) A peculiarity of the tentacles is the presence upon the outer median line of each, of a rather sparsely filled series of quiescent setæ, in strong contrast with the rapidly moving cilia around them.

The development of this polyp from the ovum, of which interesting hints have been obtained, and its internal structural peculiarities

are reserved for further study, and if satisfactory results shall have been attained, they will be treated of in a later paper. The nearly simultaneous observation of this species in three distinct localities, and its abundance in each, indicates that it is probably not uncommon, and excites surprise that it does not appear to have been previously noticed.—*Proc. Acad. Nat. Sci. Philad.*, Aug. 5, 1884, p. 213.

On a new Insect of the Genus Phylloxera (Phylloxera salicis, *Licht.*). By M. J. Lichtenstein.

I had for some time observed the presence, upon the bark of willows in my garden, of a sort of snow-white mould, like the cottony secretions of many Coccidina. By splitting a piece of bark I discovered a dried-up skin, which I softened in caustic potash, and which, under the microscope, showed the form of a *Phylloxera*. It is an insect 0·67 millim. long, with antennæ of three joints and a very long rostrum, reaching considerably beyond the abdomen.

By examining the bark I succeeded in finding in the same fissure some small ovoid envelopes of two different dimensions, some being 0·36 and others 0·25 millim., nearly colourless and looking like eggs. It was evident to me that I had not to do with true eggs, but with what I have called *sexual pupæ*. I then placed these little envelopes in a tube and examined them daily.

I first saw these little pupæ raise themselves upon the posterior extremity and begin to grow, escaping from a very fine pellicle, which, as it were, formed a stalk for them. About the fourth or fifth day I began to distinguish two little black eyes; then small and excessively short feet, and antennæ, still shorter, forming only a little three-jointed stump. For eight or ten days I was able to follow the development of this microscopic germ, balancing itself in its silky calyx and constantly rising.

Finally the evolution was completed, and, like ripe seeds, the sexual insects, male and female, dropped on to the cork of the little tube containing them, and copulation took place. The male dies soon afterwards. The female then deposits an enormous light yellow egg, nearly as large as herself, and I submitted the two sexes to the microscope.

As I had foreseen, these were really sexual insects, presenting all the characters of the *Phylloxeræ*. The rostrum is completely deficient, the limbs are nearly rudimentary, especially the antennæ, which are reduced to a very short knob.

The *mould* upon the willow is nothing but an accumulation of the cast envelopes of these pupæ, which escape in so singular a fashion from their long pellicle.

I do not know that I shall succeed in tracing the further evolution of this insect, but I can not understand, considering its abundance, how it has hitherto escaped observation. I shall call it *Phylloxera salicis*. It will fall within the group of those in which he *pupiferous* form is apterous. I shall endeavour in the spring to omplete its history.—*Comptes Rendus*, October 13, 1884, p. 616.